FORM PTO-1390 (REV. 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY 'S DOCKET NUMBER	
7170	
U.S. APPLICATION NO. (If known, see 37 CFR 1.5)	
09/926225	
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE
PCT/EP00/02639	27 March 2000
PRIORITY DATE CLAIMED	
26 March 1999	

TITLE OF INVENTION
DEVICE FOR PICTORIALLY DEPICTING THREE-DIMENSIONAL OBJECTS

APPLICANT(S) FOR DO/EO/US SETZER, STEFFEN et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [ ] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [X] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is attached hereto (required only if not communicated by the International Bureau).
   b. [ ] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. [X] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [ ] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [ ] A substitute specification.
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [ ] Other items or information:

U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/926225	INTERNATIONAL APPLICATION NO. PCT/EP00/02639	ATTORNEY'S DOCKET NUMBER 7170

21. ☒ The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1000.00		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $860.00		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $710.00		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) $690.00		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$1,040.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	10 - 20 =		x $18.00	$	
Independent claims	1 - 3 =		x $80.00	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$	
TOTAL OF ABOVE CALCULATIONS =				$1,040.00	
☒ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.			+	$	
SUBTOTAL =				$ 520.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$	
TOTAL NATIONAL FEE =				$ 520.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$	
TOTAL FEES ENCLOSED =				$ 520.00	
				Amount to be refunded:	$
				charged:	$

a. ☒ A check in the amount of $ 520.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-2105. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

JOSEFINO P. DE LEON
NAME

33,166
REGISTRATION NUMBER

Case 7170

PATENT COOPERATION TREATY
UNITED STATES DESIGNATED/ELECTED OFFICE
UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. National Stage of : September 26, 2001

PCT Application No.: PCT/EP00/02639:

PCT Filing Date: 27 March 2000 :

Priority Date: 26 March 1999 :

Inventors: SETZER, Steffen et al. :

For: DEVICE FOR PICTORIALLY :
DEPICTING THREE-DIMENSIONAL :
OBJECTS :

PRELIMINARY AMENDMENT

Honorable Commissioner of Patents and
and Trademarks
Box PCT
Washington, D.C. 20231

Dear Sir:

Please amend the above-identified application as follows:

IN THE CLAIMS:

Claim 6, line 1, please change "one of claims 1 to 5" to -- claim 1 --.

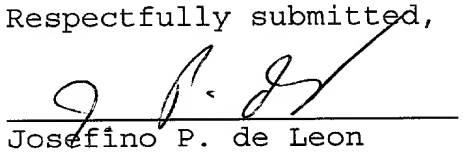
Claim 10, line 1, please change "8 or 9" to -- 8 --.

REMARKS

Applicants have amended the claims to remove multiple dependencies.

It is respectfully requested that the amendment be entered before computing the filing fee.

Respectfully submitted,



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Device for pictorially depicting three-dimensional objects

The present invention relates to a device for pictorially depicting three-dimensional objects.

For the pictorial representation of three-dimensional objects and for the creation of a three-dimensional image data record, it is known in the art to measure the distance to the object which is to be depicted by means of generally at least two cameras and to create a "point cloud", i.e. a multitude of coordinate points with assigned image information which represent the surface of the object which is to be depicted. In a further step, the established points are linked to surfaces which topologically describe the surface of the object by means of a labourious calculation process. The result is a 3-D polygon data record of the depicted object.

A process is known from US-PS 5 818 959 for the creation of a three-dimensional image from at least two two-dimensional images, wherein a three-dimensional object is recorded by at least two cameras disposed horizontally about the object. During the recording, the three-dimensional object is irradiated with a striated pattern. The first of the recorded two-dimensional images is selected as a reference image, a further image is selected as a so-called second image. On the basis of these two

images, taken from slightly-different locations, a three-dimensional image is calculated according to the so-called binocular principle, wherein the space in which the object is located is sub-divided into so-called voxels and the value of each voxel in each of the two two-dimensional images can be compared with one another. Identification of identical voxels is attained by means of the irradiated striated pattern. In order to minimise the required calculation input and to avoid the so-called background problem, cameras which are disposed further away are used to check the surface points of the object.

A process is known from US-PS 4 982 438 for recognition of the three-dimensional shape of an object, wherein the object which is to be recorded is surrounded by four pairs of cameras, especially disposed perpendicular to one another, disposed in a horizontal plane. The pairs of cameras each record a binocular image of the object. The three-dimensional shape of the object is calculated on the basis of these images in that the binocular calculation method is combined with the so-called Cone-Silhouetting Method.

A further process is known from EP 0 631 250 A2 for reproducing three-dimensional objects. With this process, a plurality of cameras are provided in different positions which are disposed so as to be moveable and/or which are suitable for recording a moved object. In a similar manner to the processes described hereinbefore, a camera is selected as a reference camera and with regard to the image captured by this camera, corresponding points are sought

in the images recorded by the other cameras which serve as a basis for the calculation of the voxel contents.

Processes are known from US-PS 4 825 393, US-PS 5 432 712, US-PS 5 577 130, US-PS 5 561 526 and US-PS 4 654 872 for the measurement of three-dimensional objects or for distance measurement, which are based on complex measurements derived from the binocular method.

The company Kaidan, Feasterville, Pennsylvania, USA, offers a photographic device under the designation Meridian C-60 which comprises a substantially C-shaped rail, along the inside of which a camera is moveably disposed. The object which is to be photographed is placed on a rotating plate in such a way that the camera which is moveable along the rail can be displaced about the object in the vertical direction.

A system is known from "Illusion rundherum" by Bayer et al, c't, 1995, Volume 8, pages 104 to 107, in connection with the "QuickTime VR" system of the company Apple, wherein to attain a three-dimensional impression of an object which a user can fluidly move in all directions by using a mouse, objects are recorded all around using individual images with 360° horizontal and 180° vertical perspective with 10° spacing to one another.

With the known systems, it is disadvantageous that data processing systems require very high computing power as a result of the complex computing methods for creation of the three-dimensional polygon data records. A further disadvantage is the so-called background problem, since with the known systems, the objects which are to be depicted

cannot be satisfactorily differentiated and demarcated from the image background.

On the basis of this, the object of the invention is to provide a device for pictorial depiction of three-dimensional objects via which three-dimensional objects can be easily and cheaply depicted and reproduced for a viewer in perspective elevation for production of a three-dimensional impression, using data processing systems with conventional computing performance. In particular, according to the invention it is to be possible to differentiate an object which is to be depicted from an image background without complex computing processes.

A device with the features of claim 1 is suggested in order to solve this object.

According to the invention, therefore, a number of recordings are made from different directions of an object which is to be depicted by means of a plurality of cameras, and each of these recordings is stored with assigned relative coordinates camera/object. Therefore, in contrast to the prior art purely two-dimensional information is stored, to which information relating to the spatial relationship between recording position and recorded object is assigned, instead of calculating a three-dimensional object data record from an abundance of recorded two-dimensional data. Reproduction of the stored image data takes place via a suitable representation program in which the corresponding two-dimensional image which corresponds to the respective view is called up,

dependent on the relative position of the object, i.e. reproduction of the stored image data takes place in perspective elevation for creation of a three-dimensional image by joining the two-dimensional image data with consideration for the associated coordinates. In this way, the impression is given that the object has been shown in a three-dimensional representation. In contrast to conventional three-dimensional applications, the device according to the invention requires substantially-less computing performance. As well as spatial and angular coordinates, the coordinates and parameters stored with the image data can also include time coordinates, which especially allows "dynamic" object depiction and corresponding representation in the case of changing, moving and also growing objects (plants).

The object which is to be depicted is turned and is recorded by means of cameras which are disposed in a spatially-defined manner. The associated angular position is assigned to each individual recording of the object, corresponding to the rotation of the object. In order to permit a perspective elevation of the object from various heights, the cameras are disposed at various heights in the space. A pre-determined number of recordings are made during a complete rotation of the object which is to be depicted. For example, during rotation of the object a recording is made every 10°, i.e. 36 recordings during a full rotation.

In an embodiment of the invention, the object which is to be depicted is recorded by means of two or more cameras, the relative positions of which are altered with regard to the object which is to be depicted. This alteration of the relative position is a rotation of the object which is to be depicted. Independent of the type of relative alteration of the

position between the camera and the object which is to be depicted, it is important that the relative coordinates of each camera to the object which is to be depicted are known at all time points. The relative coordinates are suitable spatial and/or angular coordinates.

In an advantageous embodiment of the invention, a plurality of cameras are arranged distributed spatially around the object which is to be depicted. With a sufficiently-large number of cameras which can record the object from a sufficiently-large number of directions in order to guarantee a satisfactory perspective reproduction on the basis of two-dimensional image data records, no relative alteration of the position between the cameras and the object which is to be depicted is necessary. However, if the number of cameras is not sufficiently large, the object which is to be depicted is rotated. For example, the cameras can be disposed on a cylindrical or partially-spherical (dome-like) surface which substantially symmetrically surrounds the object.

In an especially advantageous embodiment of the invention, a plurality of cameras are arranged distributed around the object, in a plane which extends through the object which is to be depicted. Here, it is preferred that the arrangement of cameras takes place along a substantially C-shaped or partially-circular rail. The object which is to be depicted is, for example, disposed approximately in the centre of the curvature of the rail. In order to create a relative position alteration, the object is either rotated or the rail, together with the camera disposed thereon, is swivelled around the object, for example along a rail which extends around the object.

In a further embodiment of the invention, the device according to the invention has a background surface with disposed approximately centrally in the curvature of the rail. In order to produce a relative position alteration, the object is either rotated or the rail, together with the camera disposed thereon, is swivelled around the object, for example along a rail which extends around the object.

In a further embodiment of the invention, for which independent protection is also sought, according to claim 16 the device according to the invention has a background surface with substantially constant colour tone in the colour space. A simple, clear and unambiguous demarcation of the object from the background is guaranteed with such a background surface which is configured so that it represents the entire image background of the recorded object in each image taken by the at least one camera.

In an embodiment of the invention, illumination means are provided to illuminate the rear side of the background which is remote from the camera. However, illumination of the background surface can also take place in a suitable manner from the side or from the front.

In another embodiment of the invention, the background surface itself is configured to be luminous, and is preferably configured as an electro-luminescing film. This also provides good demarcation results.

In order to improve still further the demarcation between the object and the background, in a further embodiment of the invention a

laminar or film-shaped filter is provided which covers the background surface.

Other advantages and embodiments of the invention result from the description and the accompanying drawings.

It is understood that the hereinbefore-named and subsequently-described features cannot only be used in the combination stated here, but also in other combinations or on their own without leaving the framework of the present invention.

The invention is described in the drawings with reference to embodiment examples, and is explained in greater detail in the following text with reference to the drawings.

Figure 1 shows a perspective schematic elevation of a first embodiment of a device according to the invention for pictorially depicting three-dimensional objects.

Figure 2 shows the device of Figure 1 in top elevation.

Figure 3 shows a schematic perspective representation of a second embodiment example of a device according to the invention with a plurality of cameras disposed along a substantially partially circular rail and of an object which is to be depicted disposed on a rotating plate.

Figure 4 shows the device of Figure 3 in another elevation.

Figure 5 shows the device of Figure 3 with suspended object

In order to clarify the principle behind the invention in a strongly-schematised representation, Figures 1 and 2 show a first embodiment of a device 10 according to the invention for pictorially depicting three-dimensional objects. Figure 1 shows the device 10 in perspective elevation whilst Figure 2 shows a top elevation of the device 10 of Figure 1.

The device 10 according to the invention for pictorially depicting three-dimensional objects comprises a multitude of cameras 12, 13 which are advantageously so-called CCD cameras or also CMOS or HDRC cameras, or any other type of digital photographic camera. The cameras 12, 13 are distributed in the space around a rotating plate 16 on which an object which is to be depicted 14 is disposed. A background surface 18 is disposed around the rotating plate 16 at a distance therefrom in such a way that it surrounds the rotating plate 16 in an axial-symmetrical manner and hence represents the jacket surface of a polygon which approximates a cylinder.

The cameras 12, 13 are arranged distributed spatially around the object 14 which is to be depicted wherein the position of each camera 12, 13 is known with regard to the object 14 which is to be depicted. The distance from each camera to the object 14 and its respective position in the room is freely selectable, i.e. there are no conditions to the extent that e.g. the cameras 12, 13 must be disposed equidistant to the object 14. In the embodiment example shown in Figures 1 and 2, first cameras 12 are disposed on the

tensioned polygon jacket surface formed by the background surface 18 and are inserted or worked into the background surface 18. In this way, the cameras 12 are each disposed at the same distance from the rotational axis of the jacket surface and the rotational axis of the rotating plate 16, which is substantially coincidental therewith.

Second cameras, provided with the reference character 13, are disposed in the interior of the volume formed by the background surface 18, partially or directly above the rotating plate 16.

When recording an object 14, at least one image is taken by each of the cameras 12, 13 which is stored together with the relative coordinates of the associated camera relative to the object 14 as a two-dimensional image data record in a storage apparatus which is not represented in greater detail. The coordinates are preferably spatial and/or angular coordinates which permit calculation of the distance between the respective camera and the object and the angle between the camera and the object (with regard to the horizontal or the vertical axis, or another reference axis).

If the number of cameras 12, 13 which are distributed in the room around the object 14 is insufficient to produce a satisfactory perspective elevation of the object which is to be depicted, for example because a substantial portion of the object 14 could not be photographed, the object 14 is rotated during recording by means of a suitable rotation means (in the illustrated example, a rotating plate 16). This rotation of the object 14, which occurs slowly, allows images to be captured and stored by each of the cameras 12, 13 disposed around the object 14

at pre-determined angular intervals, which, with consideration of the coordinates which are stored together with the images into which the respective angular position of the object flows, allows reproduction of the depicted object in perspective elevation for creation of a three-dimensional impression.

Figure 3 shows, as a preferred embodiment of the invention, a device 20 for pictorially depicting three-dimensional objects. The device 20 comprises a substantially partially circular camera arm 22, in which a plurality of cameras are arranged. The camera arm 22 is disposed upright, i.e. the plane in which the camera arm 22 lies extends substantially perpendicular to the horizontal, or the ground surface. In the following text, the camera arm 22 is designated as rail 22 for reasons of simplicity.

The cameras 24 are disposed on the rail 22 in such a way that their optical axes extend in each case substantially in the plane of the rail 22 and are substantially aligned on the central point of the partial circle of the rail 22. In other words, the cameras 24 are disposed along the rail with a substantially radial beam path.

The device 20 also comprises as a rotating apparatus a rotating plate 26 on which an object 28 which is to be depicted is disposed. The rotational axis of the rotating plate 26 is here substantially in the plane of the rail 22 and the plane in which the optical axes of the cameras 24 lie extends through the object 28.

Furthermore, the device 20 comprises a first background surface 30 and a second background surface 31. The first background surface 30 is laid out below the rail 22 and the rotating plate 26 along the ground surface, whilst the second background surface 31 is arranged substantially perpendicular to side of the rotating plate 26 which is remote from the rail 22. The background surfaces 30, 31 are disposed so that they represent the entire background in the images captured by the cameras 24.

Since the rotating plate generally lies in the image surface of every camera, it is an important part of the background and is thus preferably adapted to the background surface for reasons of standardisation, in that at least the surfaces and edges of the rotating plate which appear in the camera image are covered or coated with the same material as the background surface.

Furthermore, the device 20 has illuminating members 32 for illuminating the object 28. The illuminating members 32 are disposed near the cameras 24 in such a way that dazzle-free illumination of the object 28 is possible. The illuminating members 32 are, for example, attached to the side edges of the rail 22 by means of arms, not illustrated in greater detail, so that individual dazzle-free adjustment of the illumination is possible.

According to the invention, the background surfaces 30, 31 are advantageously configured with a substantially constant colour location in the colour space. In an especially advantageous embodiment of the invention the background surfaces are configured to be self-illuminating, for example as electro-luminescing film.

In order to attain especially good constance of the colour location, the background surfaces are covered with filters, not illustrated in the Figures in greater detail. In the case of a self-illuminating configuration of the background surfaces, it is possible under certain circumstances to dispense with the additional illuminating members 32.

Figure 4 shows the device of Figure 3,according to the invention, from another perspective.

Figure 5 shows the device 20 of Figure 3, wherein an object 29 which is to be depicted is hung via a hanging apparatus 34. Hanging the object which is to be depicted has the advantage that the underside of the object can be at least partially depicted and recorded by the cameras disposed in the lower area of the rail 22.

The hanging apparatus 34 is especially a torsion-free connection, attached to the rotating disc 26, between the rotating plate 26, the object 29 and the upper end 22b of the rail 22.

Therefore according to the invention, two-dimensional images of an object which is to be depicted are captured and stored with the relative camera coordinates as additional parameters. With the help of a suitable representation program, the image which corresponds to the respective view is called up dependent on the relative position of the viewer to the object. This gives the impression that the object is observed in a three-dimensional representation. In contrast with conventional

three-dimensional applications (CAD, animation), the process according to the invention requires considerably less computing power on the part of the utilised computer.

The background is represented as an extremely homogeneous surface with the most constant possible colour location over the entire surface by the use of a self-illuminating background surface. This fulfils the prerequisite of "cutting free" an object which is to be depicted with the help of very rapid and efficient algorithms in a qualitatively meritous manner. With existing systems, automation of the "cutting free" has hitherto not been realised due to the inhomogeneity of the background with regard to colour, brightness and contrast distribution constance.

Naturally, the invention is not limited to the embodiment examples described in the Figures and the description. For example, in the case of the embodiment example shown in Figures 3 and 5, it is possible to provide an adjustable rail which extends along the ground surface symmetrically about the rotating plate, on which the rail 22 is adjustably or swivellably mounted, so that in the case of a large and heavy or cumbersome object which is difficult to rotate on the rotating plate 26, or when recording humans, the rail 22 with additional cameras 24 is swivelled so that the object can be recorded from all sides without having to be rotated. With such an embodiment, the background surface must also be disposed so as to be swivellable or it must cover the recording space in all directions. In a first variant, especially the background surface lying opposite the rail 22, the background surface is connected

with the rail in such a way that the background surface moves together with the rail around the object and that when the rail stops (to capture an image of the object) each camera imaging surface is completely filled with the background of the background surface.

Claims

1. A device for pictorially depicting three-dimensional objects with a plurality of cameras (12, 13; 24) which are arranged distributed in defined spatial arrangement about an object (14; 28, 29) which is to be depicted, and a storage and reproduction apparatus, wherein recording of the object (14; 28, 29) which is to be depicted takes place from a plurality of recording devices of the plurality of cameras (12, 13; 24) relative to the object (14; 28, 29) by rotating the object via a rotating apparatus (16; 26), storage of two-dimensional image data of each recording apparatus takes place in the storage apparatus together with associated coordinates of the at least one camera (12, 13; 24) with regard to the object (14; 28, 29) which is to be depicted, and reproduction takes place of the stored image data in perspective elevation by generation of a three-dimensional impression by joining the two-dimensional image data with consideration for the associated coordinates.

2. A device according to claim 1, wherein the cameras are arranged on a cylindrical or partially-spherical surface surrounding the object (14) which is to be depicted.

3. A device according to claim 1, wherein means (16; 26, 34) for alteration of the relative position of the plurality of cameras (12, 13; 24) with regard to the object (14; 28, 29) which is to be depicted and means for detecting the relative

coordinates between the at least one camera (12, 13; 24) and the object (14; 28, 29) which is to be depicted are provided.

4. A device according to claim 3, wherein the plurality of cameras (24) are arranged distributed about the object (28, 29) in a plane extending through the object which is to be depicted.

5. A device according to claim 4, wherein the plurality of cameras (24) are disposed along a substantially C-shaped or partially-circular rail (22).

6. A device according to one of claims 1 to 5, with at least one camera (12, 13; 24) which can be aligned on an object (14; 28, 29) which is to be depicted for recording the object which is to be depicted and with a background surface (18; 30, 31) with substantially constant colour location in colour space.

7. A device according to claim 6, with illuminating members for illuminating the rear side of the background surface (18; 30, 31) which is remote from the camera.

8. A device according to claim 6, wherein the background surface (18; 30, 31) is self-illuminating.

9. A device according to claim 8, wherein the background surface (18; 30, 31) is an electro-luminescing film.

10. A device according to claim 8 or 9, wherein a laminar or film-shaped filter is provided which covers the background surface (18; 30, 31)

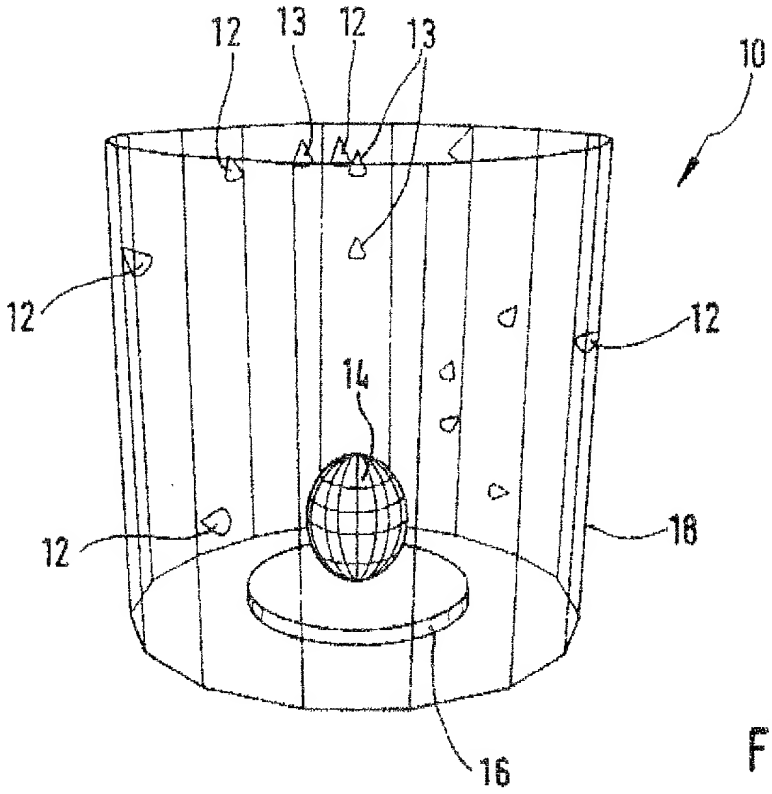

Fig. 1

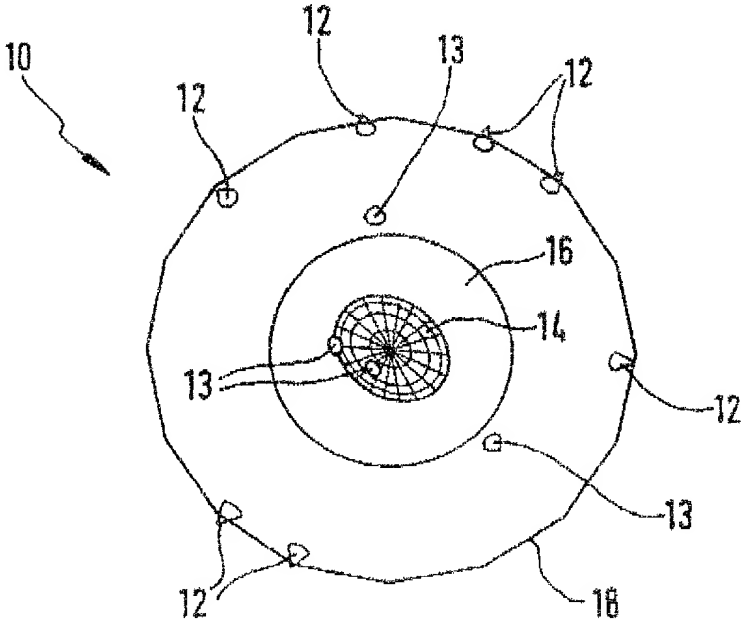

Fig. 2

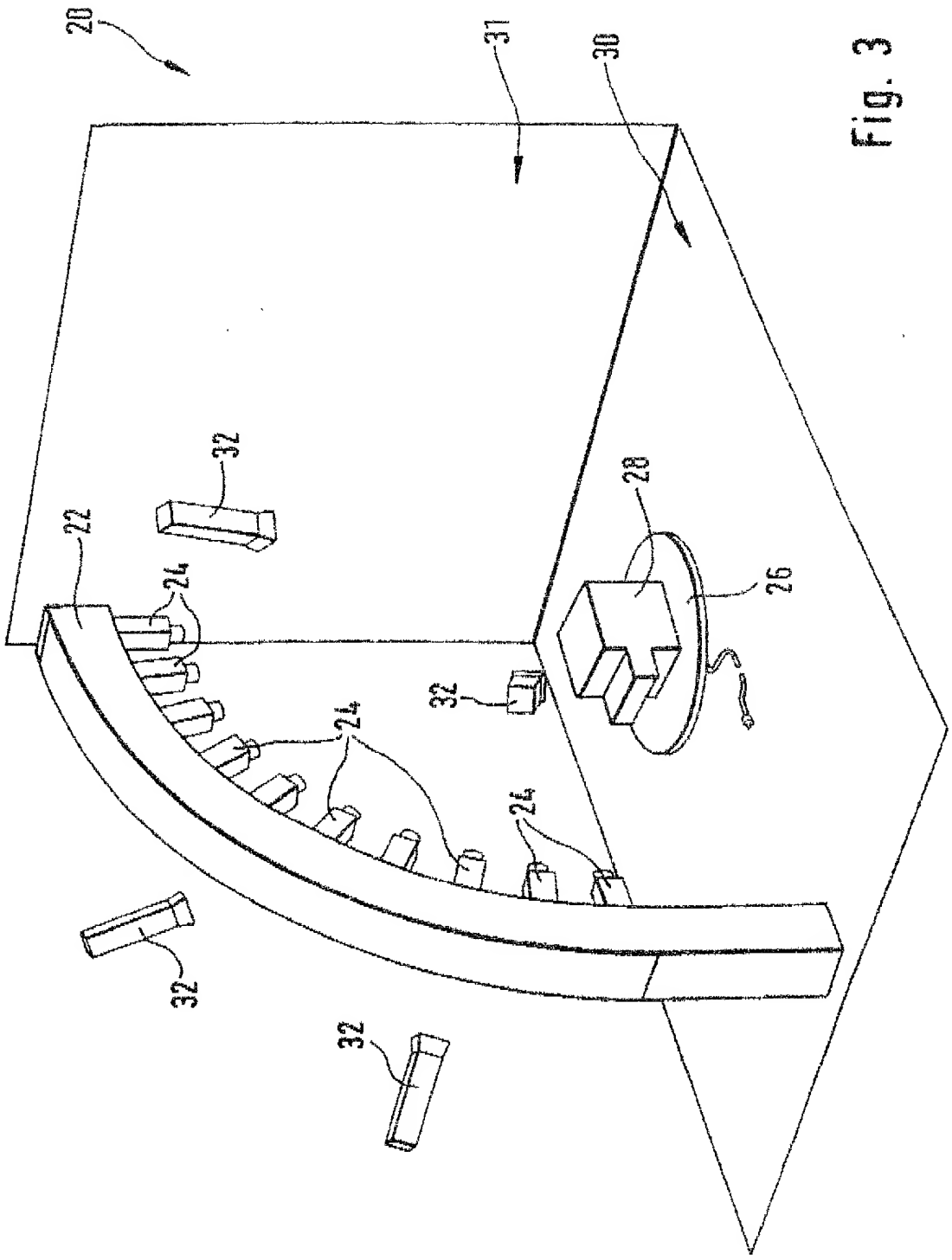

Fig. 3

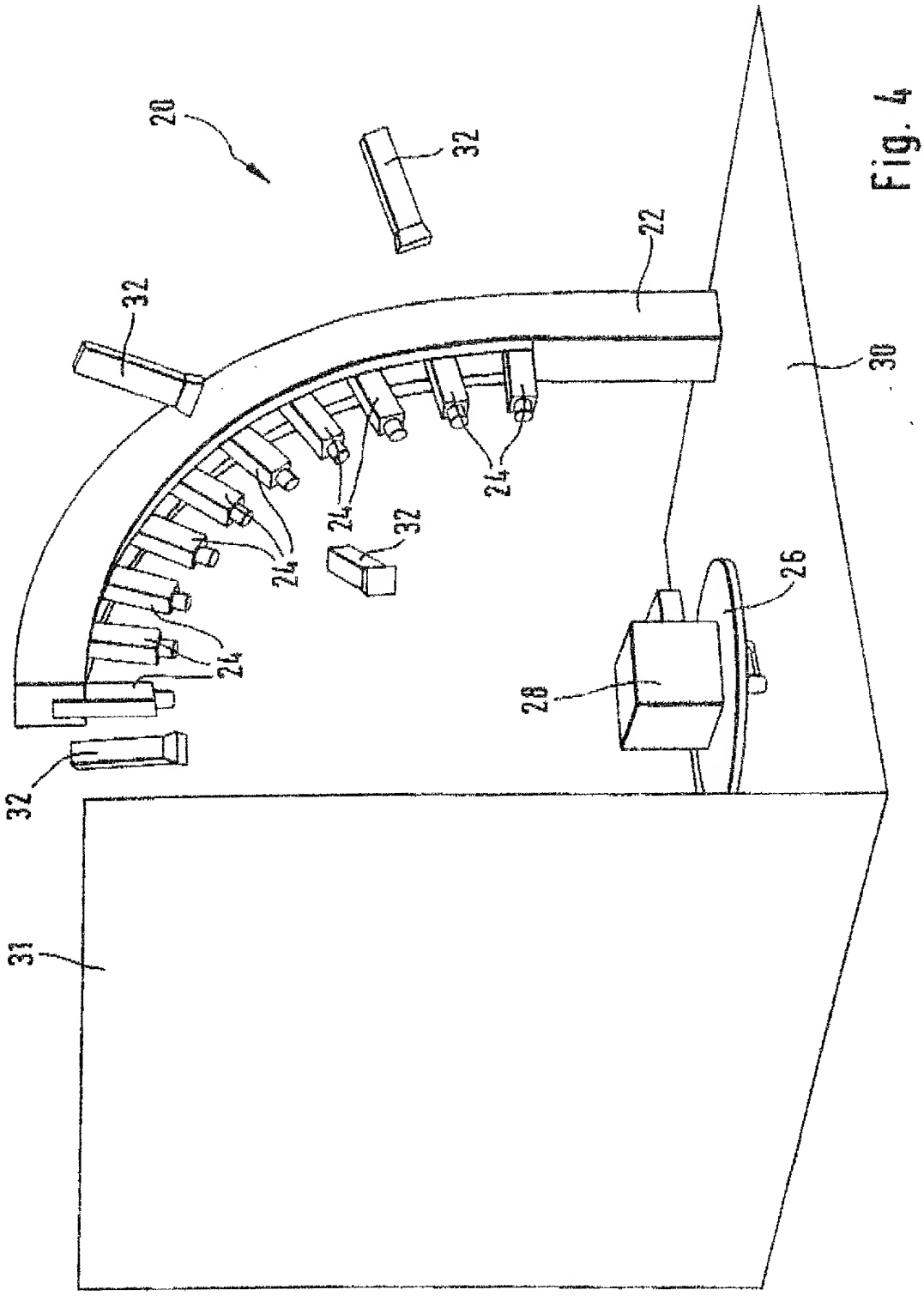

Fig. 4

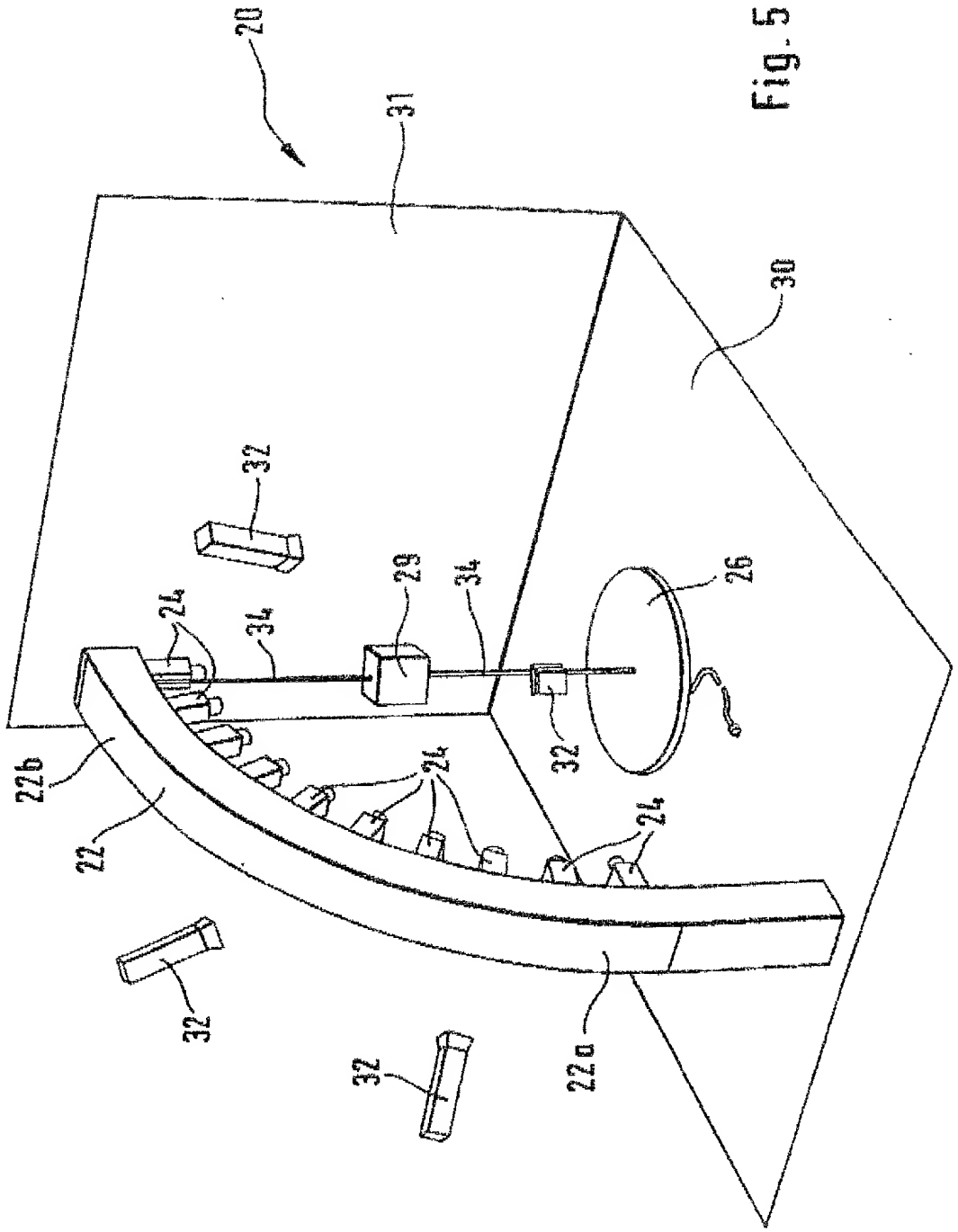

Fig. 5